

REMARKS

I. PRELIMINARY REMARKS

Claim 1, 15, 23 and 26 have been amended. Claims 22 and 29-31 have been canceled. Claims 32-36 have been added. Claims 1-21, 23-28 and 32-36 remain in the application. Reexamination and reconsideration of the application, as amended, are respectfully requested.

The minor typographical error identified by the Examiner has been corrected by the amendment to claim 1.

II. BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present inventions, as defined by the claims, are directed generally to various tissue coagulation devices. As illustrated for example in Figures 1 and 2, a surgical probe 100 in accordance with one embodiment of a present invention is provided with a shaft 102 that includes an outer structure 112. One or more energy transmission devices, such as the exemplary electrodes 106, are supported on the outer structure. In order to cool the energy transmission devices, the outer structure 112 defines fluid lumens 116 and 118 and heat from the electrodes 106 (or other energy transmission devices) passes through the outer structure to fluid flowing through the lumens.

In order to promote heat transfer from the energy transmission devices to the fluid, the outer structure may be formed from material that is relatively high in thermal conductivity. Although the inventions are not limited to any particular materials, the present application provides a few specific examples of materials that are substantially electrically non-conductive and relatively high in thermal conductivity, i.e. RTP 0299 X 85175 D nylon manufactured by RTP Company in Winona, Minnesota and CoolPoly™ RS007 polyphenylene sulfide and RS008 nylon manufactured by Cool Polymers, Inc. in Warwick, Rhode Island. [Page 14, lines 20-26.] Alternatively, or in addition, the

dimensions of the outer structure may be selected so as to facilitate substantial heat transfer.

III. PRIOR ART REJECTIONS

A. The Rejections

Claims 1-7, 11, 12, 15-21, 24, 25, 29 and 30 have been rejected under 35 U.S.C. § 103 as being unpatentable over the combined teachings of the Schaer patent (U.S. Patent No. 6,522,930) and the Swartz patent (U.S. Patent No. 6,264,654). Claims 8-10, 13, 14, 22, 23, 26-28 and 31 have been rejected under 35 U.S.C. § 103 as being unpatentable over the combined teachings of the Schaer patent, the Swartz patent, and the Maguire patent (U.S. Patent No. 5,913,854). As claims 22 and 29-31 have been canceled, applicant respectfully submits that the rejections thereof have been rendered moot. The rejections of the remaining claims under 35 U.S.C. § 103 are respectfully traversed with respect to the claims as amended above. Reconsideration thereof is respectfully requested.

B. The Schaer Patent

The Schaer patent discloses an irrigated ablation device including an outer tubular member 28, an end cap 64 and an ablation element 50 supported between the end of the tubular member and the end cap. [Figure 3.] Three tubes (i.e. an electrical lead tube 30, a fluid tube 32, and a guidewire tube 34) also extend through the tubular member 28 and ablation element 50 to the end cap 64. The ablation element 50 consists of a plurality of electrodes 52 that appear to be supported on the tubes 30-34; a porous, fluid permeable membrane 58 that is positioned around the electrodes; and a fluid space 56 that is defined therebetween. Fluid, which passes through the porous membrane 58, flows into the fluid space 56 through a slot 68 in the fluid tube 32. In one alternative configuration illustrated in Figure 5, the electrodes 52a are supported on a braided structure 76 and a

porous membrane 58a is positioned around the electrodes. Turning to Figure 6, electrodes 52b are supported on shaft 82 and a porous membrane 58b is positioned around the electrodes. In another alternative configuration illustrated in Figure 7, a porous membrane 58c is supported on a braided structure 76c, and electrodes 52c are supported on the porous membrane. Similar devices are illustrated in Figures 8-10.

C. Discussion Concerning Claims 1-14

Independent claim 1 calls for a combination of elements comprising “a shaft defining a distal end and including an outer structure formed from material that is **relatively high in thermal conductivity** and substantially electrically nonconductive,” “at least one energy transmission device **supported on the outer structure** in spaced relation to the distal end of the shaft” and “at least one fluid lumen defined by the outer structure and located such that a portion thereof is aligned with the at least one energy transmission device.” The cited references fail to teach or suggest such a combination.

There are a variety of differences between the invention defined by independent claim 1 and the devices disclosed in the Schaer patent. For example, the Schaer patent fails to teach or suggest the use of an outer structure (i.e. the devices on which the Schaer electrodes are supported) that is formed from material that is relatively high in thermal conductivity. More specifically, the Schaer patent fails to teach or suggest that the tubes 30-34 (Figure 3), the braided structures 76 (Figure 5), the shaft 82 (Figure 6), or the porous membrane 58c (Figure 7) are formed from material that is relatively high in thermal conductivity.

The Office Action attempts to remedy this deficiency in the Schaer patent with the teachings of the Swartz patent. Applicant respectfully submits that the Swartz patent, which discloses a catheter that emits conductive fluid through openings in its distal end, fails to do so. The Swartz patent indicates that the catheter may be formed from, amongst other things, “nylons.” [Column 8, lines 34-41.] The Swartz patent is completely silent as to the heat transfer properties of the “nylons” and other conventional materials listed in column 8. Nevertheless, the Office Action appears to have relied on applicant’s

specification for the proposition that “nylon” has relatively high thermal conductivity and, based on this reliance, concluded that it would have been obvious to substitute the “nylon” disclosed in the Swartz patent for the materials disclosed in the Schaer patent.

Notwithstanding the fact that it is improper to use the teachings of applicant’s specification in the manner proposed in the Office Action, applicant’s specification does not in any way, shape or form indicate that “nylon” generically is a material that has “relatively high in thermal conductivity.” To the contrary, the specification indicates that two very specific types of nylon are examples of materials that have “relatively high in thermal conductivity.” Given the fact that there is nothing in the Swartz patent which would indicate that the “nylons” referred to therein have any particular heat transfer properties, let alone “relatively high in thermal conductivity,” applicant respectfully submits that the Schaer and Swartz patents fail to teach or suggest the invention defined by claim 1, even when improperly combined in the manner proposed in the Office Action.

As the Schaer and Swartz patents fail to teach or suggest the combination of elements recited in independent claim 1, whether viewed alone or in combination, applicant respectfully submits that the rejection of claims 1-7, 11 and 12 under 35 U.S.C. § 103 is improper and should be withdrawn.

Turning to claims 8-10, 13 and 14, applicant respectfully submits that the Maguire patent fails to remedy the aforementioned deficiencies in the proposed Schaer/Swartz combination. As such, claims 8-10, 13 and 14 are patentable for at least the same reasons as independent claim 1 and the rejection thereof under 35 U.S.C. § 103 should also be withdrawn.

D. Discussion Concerning Claims 15-21 and 23-28

Independent claim 15 calls for a combination of elements comprising “a shaft ... including an outer structure,” “at least one energy transmission device supported on the outer structure in spaced relation to the distal end of the shaft,” “a fluid inlet lumen defined by the outer structure such that a wall having a wall thickness ... and including

inner and outer lumen surfaces defining a distance therebetween that is greater than the wall thickness” and “a fluid outlet lumen defined by the outer structure and operably connected to the fluid inlet lumen.” The claim also indicates that “the outer structure is configured such that the fluid inlet lumen includes an inlet associated with proximal portion of the shaft, the fluid outlet lumen defines an outlet associated with the proximal portion of the shaft, and **all fluid entering the outer structure through the fluid inlet will exit the outer structure through the fluid outlet.**” The cited references fail to teach or suggest such a combination.

For example, the Schaer and Swartz patents are directed to devices that emit fluid from the distal end of the devices. More specifically, the Schaer patent discloses a variety of devices with porous, **fluid permeable** membranes through which at least some fluid passes. The Schaer patent also discloses that a return passageway may be provided to return some of the fluid. [Column 17, lines 35-39.] The Swartz patent is directed to catheter that emits conductive fluid through openings in its distal end.

The Maguire patent, which discusses the use of a fluid return passageway (column 5, lines 7-24), fails to remedy the above-identified deficiencies in the Schaer and Swartz patents. For example, the Schaer devices (including the versions with a return passageway) are specifically designed to emit fluid through a porous, fluid permeable membrane and it would not have been obvious to modify the Schaer devices such that they failed to operate in the intended manner. Additionally, there is nothing in the Schaer, Swartz and Maguire patents that would even remotely indicate that if inlet and outer lumens were **defined by** an outer structure on which an energy transmission device was supported, that the inlet lumen would have the configuration set forth in independent claim 15.

IV. NEWLY PRESENTED CLAIMS 32-36

Newly presented claims 32-34 depend from independent claim 1 and are patentable for at least the same reasons as independent claim 1.

Newly presented claims 35 and 36 depend from independent claim 15 and are patentable for at least the same reasons as independent claim 15.

V. CLOSING REMARKS

In view of the foregoing, it is respectfully submitted that the claims in the application are in condition for allowance. Reexamination and reconsideration of the application, as amended, are respectfully requested. Allowance of the claims at an early date is courteously solicited.

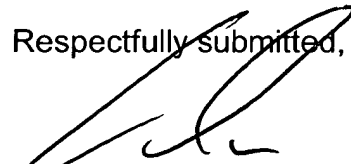
If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is respectfully requested to call applicant's undersigned representative at (310) 563-1458 to discuss the steps necessary for placing the application in condition for allowance.

The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 50-0638. Should such fees be associated with an extension of time, applicant respectfully requests that this paper be considered a petition therefor.

11/5/03
Date

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Respectfully submitted,



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